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THE LIST OF THE SUBFAMILY HELICONIINAE (LEPIDOPTERA : NYMPHALIDAE) COLLECTED IN COLOMBIA AND THE ADJACENT AREA, SOUTH AMERICA, DURING THE EXPEDITION "LA EXPEDICION JAPONESA A LAS ZONAS AMAZONICAS, 1973", WITH DESCRIPTION OF A NEW SUBSPECIES

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The Heliconiinae (Nymphalidae) are distributed in the Neotropical Region and exhibit a highly developed polymorphism and mimetic relationships within the subfamily or between other butterflies. Neustetter (1929) recognized 107 species of the Heliconiinae (except for such genera as *Philaethria*, *Dryadula*, *Agraulis*, *Dione*, *Podotrica* and *Colaenis*). Emsley (1963, 1965) studied the Heliconiinae by means of modern systematics and interbreeding some "species" and reduced them to 55 species, including the six genera above mentioned. Brown & Mielke (1972) backed them to 66 species by field research and investigating their immature stages. Ackery & Smiles (1976) did some taxonomical changes in their list owing to Brown's opinion.

The author reports the list of the Heliconiinae, including 25 species, collected mainly in Colombia, South America, during the expedition "La Expedición Japonesa a las Zonas Amazonicas, 1973", which was organized by the explorative association "Congreso Andinista del Japón" and the Kyôdô Press. The author participated in the expedition and surveyed butterflies mainly in the tropical area, lower than 650m in altitude, from July to September in the year 1973. In this paper, a new subspecies of *Heliconius elevatus* Nördner is described, which was collected in the vicinity of Leticia, Colombian and Brasilian territory.

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Surveyed localities

Colombia

Departamento del Chocó : vicinity of Quibdó (Tanandó, Río Guayabal, La Troje)
Departamento del Valle : vicinity of Buenaventura (Zabaletas, near Bajo Calima)
Departamento de Antioquia : the Cauca River (La Pintada)
Departamento de Santander : vicinity of Bucaramanga (Casa Nueva)
Departamento de Cundinamarca : the eastern slope of the Cordillera Oriental (Guayabetal)
Departamento del Meta : vicinity of Villavicencio (Cerro Cristo Rey, Río Guatiquía, Río Guayuriba)
Intendencia del Caquetá : vicinity of Florencia (West of Florencia, San José)
Comisaría del Vaupés : Mitú
Comisaría del Amazonas : Leticia (including Brasilian territory)

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Perú

Departamento del Huánuco : the Huallaga River (Tingo María)

The list of the Heliconiinae

1. *Philaethria dido* (Clerck)

This species was found in the sunny forest side flying 2-3m in height above the ground. Some males were observed settling on twigs and pursueing other individuals in their territories. (Fig. 1)

4♂♂, near Bajo Calima, Colombia, Aug. 12 ; 2♂♂, Río Guatiquía, Colombia, July 30 ; 1♀, same locality, Aug. 20 ; 1♀, Mitú, Colombia, Aug. 17 ; 1♂, Leticia, Colombia, Sept. 8 ; 1♂, same locality, Sept. 9.

2. *Dryadula phaetusa phaetusa* (Linnaeus)

This species was observed visiting flowers of *Lantana*. (Figs. 2-3)

1♂, 1♀, La Pintada, Colombia, Aug. 30 ; 1♂, Leticia, Colombia, Sept. 8.

3. *Agraulis lucina* (C. & R. Felder)

One female was captured at the sunny forest side near Florencia. *A. vanillae*, its sibling species, was never found during the expedition. (Fig. 4)

1♀, west of Florencia, Colombia, Aug. 25.

4. *Dione juno juno* (Cramer)

One famale was observed laying eggs in a cluster beneath the leaf of *Passflora*, with its wings closed, at the sunny forest side along the Guatiquía River. The egg cluster consisted of about 100 eggs. (Fig. 5)

2♂♂, La Pintada, Colombia, Aug. 30 ; 1♂, Río Guatiquía, Colombia, July 30 ; 1♂, Río Guayuriba, Colombia, July 31 ; 1♂, 1♀, same locality, Aug. 22 ; 2♂♂, Leticia, Colombia, Sept. 8.

5a. *Colaenis iulia iulia* (Fabricius)

The subspecies *iulia* was commonly seen around the secondary forest in the eastern foot of the Cordillera Oriental. Many males were observed sucking the water in a group at the bank of the Guayuriba River, the vicinity of Villavicencio. (Figs. 6-7)

1♂, Guayabetal. Colombia, Aug. 1 ; 1♀, Cerro Cristo Rey, Colombia, July 29 ; 4♂♂, Río Guatiquía, Colombia, July 30 ; 1♂, same locality, Aug. 20 ; 4♂♂, Río Guayuriba, Colombia, Aug. 22 ; 1♂, west of Florencia, Colombia, Aug. 25 ; 1♀, Mitú, Colombia, Aug. 18 ; 3♂♂, Leticia, Colombia, Sept. 8.

5b. *Colaenis iulia moderata* Stichel

The subspecies *moderata* was seen in the Cauca Valley and the pacific coast region. Three males were captured while visiting flowers of *Lantana* at the sunny forest side in La Pintada. (Fig. 8)

2♂♂, Tanandó, Colombia, Sept. 1 ; 1♂, Zabaletas, Colombia, Aug. 11 ; 5♂♂, near Bajo Calima, Colombia, Aug. 12 ; 3♂♂, La Pintada, Colombia, Aug. 30.

6. *Heliconius* (*Eueides*) *aliphera aliphera* (Godart)

This species was commonly found in the sunny forest side accompanied by the preceding species. A larva of the middle stage was found beneath the leaf of *Passiflora* near Bucaramanga. In the pacific coast region, the colour pattern of this butterfly grades into that of the subspecies *gracilis* (Stichel). (Fig. 9)

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2♂♂, La Troje, Colombia, Sept. 3; 1♀, near Bajo Calima, Colombia, Aug. 12; 1♂, 2♀♀, Zabaletas, Colombia, Aug, 11; 1♂, La Pintada, Colombia, Aug. 30; 1♂, 1 larva, Casa Nueva, Colombia, Sept. 14; 1♀, Guayabetal, Colombia, Aug. 1; 3♂♂, 1 ♀, Río Guatiquía, Colombia, July 30; 1♀, Río Guayuriba, Colombia, July 31; 1♂, same locality, Aug. 22; 1♂, west of Florencia, Aug. 25.

7. *Heliconius* (*Eueides*) *isabella isabella* (Cramer)

The subspecies *isabella* exibits a polymorphism in many localities. It was abundantly found in the vicinity of Villavicencio, flying gently in the forest side and visiting flowers. (Figs. 10-13)

2♂♂, near Bajo Calima, Colombia, Aug. 12; 3♂♂, 2♀♀, La Pintada, Colombia, Aug. 30; 1♂, 1♀, Cerro Cristo Rey, Colombia, July 29; 1♂, southwest of Villavicencio, Colombia, Aug. 23; 4♂♂, 6♀♀, Río Guatiquía, Colombia, July 30; 4♂♂, 7♀♀, same locality, Aug. 20; 1♂, 1♀, Río Guayuriba, Colombia, July 31; 1♂, 1♀, same locality, Aug. 22; 2♂♂, Tingo María,, Perú, July 26.

8a. *Heliconius* (*Eueides*) *lybia lybia* (Fabricius)

The subspecies *lybia* was not so commonly found in the sunny forest side. (Fig. 14)

1♀, Río Guatiquía, Colombia, Aug. 20; 1♀, Leticia, Colombia, Sept. 8; 1♂, same locality, Sept. 9.

8b. *Heliconius* (*Eueides*) *lybia olympia* (Fabricius)

This subspecies was rarely found around the forest in the pacific coast region. (Fig. 15)

1♀, Tanandó, Colombia, Sept. 1; 1♂, near Bajo Calima, Colombia, Aug. 12; 1♂, Zabaletas, Colombia, Aug. 11.

9. *Heliconius* (*Eueides*) *tales heliconioides* (C. & R. Felder)

This species was found abundantly around the forest in the vicinity of Villavicencio. (Fig. 16)

5♂♂, 2♀♀, Cerro Cristo Rey, Colombia, July 29; 2♂♂, 2♀♀, Río Guatiquía, Colombia, July 30; 4♂♂, 4♀♀, same locality, Aug. 20; 2♂♂, Río Guayuriba, Colombia, July 31.

10. *Heliconius* (*Heliconius*) *godmani* Staudinger

This species was found only in the vicinity of Buenaventura, the pacific coast region. The specimens were collected while visiting flowers of *Lantana*. (Figs. 17-18)

2♂♂, 2♀♀, near Bajo Calima, Colombia, Aug. 12.

11. *Heliconius* (*Heliconius*) *wallacei flavescens* Weymer

This species prefers to inhabit rather thick forest. Sometimes it was observed flying together with similarly colour-patterned *H.* (*H.*) *sara thamar* (Hübner), however, the habitats seemed to be more localized. (Fig. 19)

4♂♂, west of Florencia, Colombia, Aug. 25; 3♂♂, 1♀, San José, Colombia, Aug. 26; 1♂, Leticia, Colombia, Sept. 10; 1♂, Tingo María, Perú, July 24.

12. *Heliconius* (*Heliconius*) *doris* (Linnaeus)

This species was commonly found in the vicinity of Villavicencio. Most of the collected specimens belong to the "blue form" *doris* and only one to the "red form" *transiens*. (Figs. 20-21)

f. *doris* (Linnaeus)

2♂♂, 1♀, Río Guatiquía, Colombia, July 30; 1♂, 1♀, Río Guayuriba, Colombia, July 31; 1♀, west of Florencia, Colombia, Aug. 25; 2♂♂, Tingo María, Perú, July 25.

f. *transiens* Staudinger

1♀, Río Guatiquía, Colombia, Aug. 20.

13a. *Heliconius* (*Heliconius*) *xanthocles melete* C. & R. Felder

The subspecies *melete* was found together with similarly colour-patterned *H.* (*H.*) *erato venustus* Salvin along a sunny pathway through the tropical rain forest in Mitú. (Fig. 22)

1♀, Mitú, Colombia, Aug. 18.

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13b. *Heliconius* (*Heliconius*) *xanthocles flavosia* Kaye

The subspecies *flavosia* was found in the vicinity of Villavicencio flying together with similarly colour-patterned *H.* (*E.*) *tales heliconioides* (C. & R. Felder). (Fig. 23)

2♀♀, Río Guayuriba, Colombia, July 31.

14. *Heliconius* (*Heliconius*) *aristiona* Hewitson

This species prefers to inhabit a thick forest. Polymorphism of this species was seen in the vicinity of Villavicencio and Florencia. Mimetic relationships between this butterfly and similarly colour patterned ones, observed during the expedition, are shown in Table 1. (Figs. 24-31)

f. *idalion* Weymer

1♂, Cerro Cristo Rey, Colombia, July 29; 1♂, Río Guatiquía, Colombia, July 30.

f. *confluens* Neustetter

1♂, Cerro Cristo Rey, Colombia, July 29; 2♀♀, Río Guatiquia, Colombia, Aug. 20; 1♂, San José, Colombia, Aug. 26.

f. *euphone* C. & R. Felder

1♂, west of Florencia, Colombia, Aug. 25; 1♂, San José, Colombia, Aug. 26.

f. *messene* C. & R. Felder

2♂♂, Río Guatiquía, July 30; 2♂♂, Río Guayuriba, Colombia, July 31; 2♂♂, 2♀♀, San José, Colombia, Aug. 26.

f. *timaeus* Weymer

1♂, Río Guayuriba, Colombia, Aug. 22; 1♂, San José, Colombia, Aug. 26; 1♂, 1♀, Tingo María, Perú, July 26,

f. *bicoloratus* Butler

1♂, Tingo María, Perú, July 25; 1♂, same locality, July 26.

15a. *Heliconius* (*Heliconius*) *ismenius ismenius* Latreille

In San José, near Florencia, only the typical *ismenius* was collected, without any variations, which seemed to be monomorphic. It prefers to inhabit a thick forest and was observed flying together with several forms of *H.* (*H.*) *aristiona* Hewitson in the same habitat. But the author could not find there any butterflies closely resembling *ismenius* in their colour patterns. (Fig. 32)

3♂♂, 3♀♀, San José, Colombia, Aug. 26.

15b. *Heliconius* (*Heliconius*) *ismenius metaphorus* Weymer

In the pacific coast region, the subspecies *metaphorus* Weymer was found, which includes the f. *metaphorus* Weymer, f. *faunus* Staudinger and a transitional form between them. The colour patterns of these forms correspond to those of *H.* (*H.*) *ethilla melicerta* Bates. (Figs. 33-34) (Table 1)

f. *metaphorus* Weymer

1♀, Río Guayabal, Colombia, Sept. 2.

f. *faunus* Staudinger

1♀, near Bajo Calima, Colombia, Aug. 12.

transitional form between *metaphorus* and *faunus*

1♂, Río Guayabal, Colombia, Sept. 2.

16. *Heliconius* (*Heliconius*) *numata silvana* (Cramer)

This species was found in the tropical rain forest of Leticia, the southern limit of Colombia. (Fig. 35)

1♂, Leticia, Colombia, Sept. 9; 2♂♂, same locality, Sept. 10; 1♀, near Leticia, Brasíl, Sept. 11.

17a. *Heliconius* (*Heliconius*) *ethilla melicerta* Bates

The subspecies *melicerta* was found in the pacific coast region, including the two forms, *melicerta* and *semiphorus*, which are closely analogous with the two forms of *H.* (*H.*) *ismenius metaphorus* Weymer respectively (Table 1, Figs. 36-37). This subspecies was found also in the Cauca Valley as the form *holcophora* Staudinger (Fig. 38).

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In the preceding paper, the author reported the two forms of this species, such as *melicertus* Bates and *semiflavidus* Weymer, from the Sierra Nevada de Santa Marta, northern Colombia (Takahashi, 1974), however, by the later investigation, the former is considered to be treated as the subspecies *melicerta* Bates and the latter as the subspecies *metalilis* Butler.

f. *melicerta* Bates

1♀, La Troje, Colombia, Sept. 3; 2♂♂, Zabaletas, Colombia, Aug. 11.

f. *semiphorus* Staudinger

1♀, Zabaletas, Colombia, Aug. 11.

f. *holcophora* Staudinger

1♂, La Pintada, Colombia, Aug. 30.

17b. *Heliconius* (*Heliconius*) *ethilla ithaca* C. & R. Felder

The subspecies *ithaca* was found in the vicinity of Villavicencio and the two forms, *ithaca* and *vittatus*, were recognized (Figs. 39-40). The colour patterns of these forms correspond to those of *H.* (*H.*) *aristiona* (Hewitson) (Table 1).

f. *ithaca* C. & R. Felder

1♂, Río Guatiquía, Colombia, July 30; 1♀, same locality, Aug. 20.

f. *vittatus* Butler

1♂, 1♀, Río Guatiquía, Aug. 20.

18. *Heliconius* (*Heliconius*) *elevatus schmidt-mummi* ssp. nov.

Upperside, wing colouration similar to that of the subspecies *taracuanus* Bryk, but the forewing discal yellow patch smaller and more evidently divided into several pieces by blackish streaks along veins, and the blackish fluke shaped flagment at the cell end is located not at the centre but near the proximal margin of the yellow patch. The forewing yellow patch arises at the vein Sc and ends at a small piece over the vein Cu_1a. Sometimes a yellow vestige occurs in the same space distally along the vein Cu_1b. The shape of the yellow patch is comparatively stable and monomorphic, and the forewing colouration roughly corresponds to that of *H.* (*H.*) *erato reductimacula* Bryk, which was observed flying together with this new subspecies in the same habitat. The width of the forewing yellow patch of the five subspecies of *H.* (*H.*) *elevatus* Nördner is as follows: *perchlorus* Joicey & Kaye > *taracuanus* Bryk > *schmidt-mummi* ssp. nov. > *elevatus* Nördner > *pseudocupidineus* Neustetter. Generally, the width of the forewing yellow patch is reduced to narrower one outside the discal cell, as advancing towards the upper stream in the Amazonian Region as well as the other dennis-rayed Heliconian butterflies. Hindwing colouration is similar to that of the typical *elevatus*. On the hindwing underside, a yellow streak along the vein Sc-R1, which is the prominent character of this species, although in the dennis-rayed forms of *H.* (*H.*) *melpomene* (Linnaeus) always red instead of yellow. (Fig. 41, Table 3)

Forewing length, 39-43 mm.

Male genitalia is illustrated in Fig. 67.

Distribution, Leticia and its vicinity (Colombian and Brasilian territory).

Habitat, the tropical rain forest and its surrounding.

The subspecific name is dedicated to Dr. Ernesto W. Schmidt-Mumm (Optometra, Bogotá), who is an earnest researcher on the Heliconiinae and offered the author many informations about the Heliconian butterflies of Colombia, during the expedition.

Holotype, ♂, near Leticia, Brasíl, Sept. 11. Paratypes, 1♂, Leticia, Colombia, Sept. 9; 2♂♂, same locality, Sept. 10; 2♂♂, near Leticia, Brasíl, Sept. 11, 1♂, same locality, Sept. 12.

The holotype is preserved in National Science Museum, Tôkyô, and the paratypes in the museum above mentioned and the author's collection.

19a. *Heliconius* (*Heliconius*) *melpomene melpomene* (Linnaeus)

The subspecies *melpomene* was found in the vicinity of Villavicencio, flying together with similarly colour-patterned *H.* (*H.*) *erato hydarus* Hewitson. (Figs. 42-43, Table 2)

f. *melpomene* (Linnaeus)

3♀♀, Cerro Cristo Rey, Colombia, July 29; 1♂, southwest of Villavicencio, Colombia, Aug. 23; 1♂, Río Guatiquía, Colombia, July, 30; 2♂♂, Río Guayuriba, Colombia, July 31; 1♂, 1♀, same locality, Aug. 22.

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ab. *melpomenides* Riffarth

1♂, Río Guayuriba, Colombía, Aug. 22,

aberrant form (with a diffused red short streak behind the cell of the hindwind underside, and a vestige of that on the hindwing upperside).

1♀, Río Guatiquía, Colombia, Aug. 20.

19b. *Heliconius* (*Heliconius*) *melpomene vulcanus* Butler.

The subspecies *vulcanus* was found in the pacific coast region, visiting flowers of *Lantana* and flying together with similarly colour-patterned *H.* (*H.*) *erato venus* Staudinger. (Fig. 44-45, Table 2)

2♂♂, 1♀, Río Guayabal, Colombia, Sept. 2; 2♂♂, near Bajo Calima, Colombia, Aug. 12; 1♂, Zabaletas, Colombia, Aug. 11.

19c. *Heliconius* (*Heliconius*) *melpomene aglaope* C. & R. Felder

The subspecies *aglaope* was found in the vicinity of Florencia, flying together with similarly colour-patterned *H.* (*H.*) *erato emma* Riffarth. (Figs. 46-47, Table 2)

f. *aglaope* C. & R. Felder

1♂, west of Florencia, Colombia, Aug. 25; 1♂, San José, Colombia, Aug. 26.

f. *rubra* Stichel

1♂, west of Florencia, Colombia, Aug. 25.

19d. *Heliconius* (*Heliconius*) *melpomene amaryllis* C. & R. Felder

The subspecies *amaryllis* was found in Tingo María, flying together with similarly colour-patterned *H.* (*H.*) *erato favorinus* Hoppfer. (Fig. 48, Table 2)

2♂♂, 1♀, Tingo María, Perú, July 24; 1♂, same locality, July 25.

20. *Heliconius* (*Heliconius*) *cydno zelinde* Butler

This species was found around the thick forest in Zabaletas, the vicinity of Buenaventura. (Fig. 49)

2♂♂, 2♀♀, Zabaletas, Colombia, Aug. 11.

21. *Heliconius* (*Heliconius*) *longarenus* (Hewitson)

Collected specimens have never orange band in their forewings, which is present in the typical *longarenus*.

One male was collected near Bajo Calima, the vicinity of Buenaventura, while visiting flowers of *Lantana*, and it was very sensitive and difficult to capture. It closely resembles *H.* (*H.*) *godmani* Staudinger in colour pattern, flying together with this species in the same habitat, however, being distinguishable in absence of a yellow spot in the forewing cell, which is present in the *godmani*. (Fig. 50)

Another specimen, a female, was collected in Río Guayabal, the vicinity of Quibdó, with an additional yellow patch in the space Cu_1a-Cu_1b of the forewing, which is seen in very similarly colour-patterned *H.* (*H.*) *hecalesia gynaesius* Hewitson, but most of submarginal yellow spots are bisected respectively, as well as the typical *longarenus*, being not bisected but compact in the *gynaesius*. (Fig. 51)

The author is not sure whether this species is mono- or polymorphic in those localities and classification of those two forms collected during the expedition remains as a problem.

1♀, Río Guayabal, Colombia, Sept. 2; 1♂, near Bajo Calima, Colombia, Aug. 12.

22a. *Heliconius* (*Heliconius*) *erato hydarus* (Hewitson)

The species erato is widely distributed in the Neotropical Region from Méjico to Brasíl and exhibits highly developed "Müllerian Mimicry" between *H.* (*H.*) *melpomene* (Linnaeus) in many areas. (Table 2) The species *erato* prefers to inhabit rather a thin forest in comparison with that the habitat of the species *melpomene* is generally established in a thick forest. In many cases, the *erato* occurs more abundantly than the *melpomene* when both the two species inhabit the same habitat. It is very hard to distinguish these two species each other while flying together because of close resemblance in their colour patterns and flights.

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The subspecies *hydarus* was commonly found in the vicinity of Villavicencio, flying together with the mimetic butterfly, *H.* (*H.*) *melpomene melpomene* (Linnaeus). Most of the collected specimens belong to the form *adana* Seitz, without a red spot in the middle of the hindwing, and the typical *hydarus* was never obtained. In the preceding paper, the author reported the form *hydarus* from the Sierra Nevada de Santa Marta, northern Colombia (Takahashi, 1974), but it is to be treated as the form *adana* of the subspecies *hydarus* by the reason above mentioned. (Figs. 52-53, Table 2)

f. *adana* Seitz

4♂♂, 2♀♀, Cerro Cristo Rey, Colombia, July 29; 1♂, same locality, Aug. 7; 1♂, south-west of Villavicencio, Colombia, Aug. 23; 2♂♂, 4♀♀, Río Guatiquía, Colombia, July 30; 2♂♂, 3♀♀, same locality, Aug. 20; 2♂♂, Río Guayuriba, Colombia, July 31.

aberrant form (forewing red patch proximally paler)

1♀, Río Guatiquía, Colombia, Aug. 20.

22b. *Heliconius* (*Heliconius*) *erato venus* Staudinger

The subspecies *venus* was found in the pacific coast region, visiting flowers of *Lantana* and flying together with a similarly colour-patterned butterfly, *H.* (*H.*) *melpomene vulcanus* Butler. (Fig. 54-55, Table 2)

1♂, La Troje, Colombia, Sept. 3; 3♂♂, 1♀, Río Guayabal, Colombia, Sept. 2; 7♂♂, 2♀♀, near Bajo Calima, Colombia, Aug. 12; 1♂, Zabaletas, Colombia, Aug. 11.

22c. *Heliconius* (*Heliconius*) *erato chestertonii* Hewitson

The subspecies *chestertonii* was found in the Cauca Valley. (Fig. 56)

The author witnessed there a black Heliconian butterfly with a large red patch in the forewing, which was supposed to be *H.* (*H.*) *melpomene melpomene* (Linnaeus), though the *melpomene* has never been correctly recorded in the Cauca Valley. If it is the species *melpomene*, a mimetic relationship between the two species, *erato* and *melpomene*, will not be established there, in contrast with the many cases between the two species. (Table 2)

2♂♂, La Pintada, Colombia, Aug. 30.

22d. *Heliconius* (*Heliconius*) *erato emma* Riffarth

The subspecies *emma* was found flying together with similarly colour-patterned *H.* (*H.*) *melpomene aglaope* C. & R. Felder, in the vicinity of Florencia. Colour patterns of the collected specimens are comparatively stable and monomorphic. There, the *emma* occurred more abundantly than the *aglaope*, as well as the species *erato* is commoner than the species *melpomene* in many localities. (Fig. 57, Table 2)

1♂, 1♀, west of Florencia, Colombia, Aug. 25; 4♂♂, San José, Colombia, Aug. 26.

22e. *Heliconius* (*Heliconius*) *erato reductimacula* Bryk complex

In the vicinity of Leticia, situated at the southern limit of Colombia, including the Colombian and Brasilian territory, the species *erato* exhibits a polymorphism in the shape of the forewing yellow patch. It is supposed that the variations are owing to the hybridization among the subspecies, such as *reductimacula*, *lativitta*, *venustus* and *emma*, each other. Most of the collected specimens have the characters of *reductimacula* Bryk, *lativitta* Butler and the transitional forms between them. The colour pattern of the *reductimacula* resembles that of *H.* (*H.*) *elevatus schmidt-mummi* ssp. nov. flying together in the same habitat. The author could not find there *H.* (*H.*) *melpomene* (Linnaeus), which exhibits highly developed "Müllerian Mimicry" with this species *erato* in many localities. (Fig. 58, Table 3)

1♂, 2♂♂, Leticia, Colombia, Sept. 8; 1♂, 3♀♀, same locality, Sept. 9; 4♂♂, 2♀♀, same locality, Sept. 10; 3♂♂, 2♀♀, near Leticia, Brasíl, Sept. 11; 1♀, same locality, Sept. 12.

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22f. *Heliconius* (*Heliconius*) *erato venustus* Salvin

One male was obtained in Mitú, along the Vaupés River. The collected specimen is recognized approximately as the subspecies *venustus* Salvin. There, the author collected a female of similarly colour-patterned *H.* (*H.*) *xanthocles melete* C. & R. Felder. Brown (1973) illustrated *H.* (*H.*) *aoede lucretius* Weymer from Mitú, which closely resembles the *venustus* and the *melete* in colour pattern. (Fig. 59, Table 3)

1♂, Mitú, Colombia, Aug. 18.

22g. *Heliconius* (*Heliconius*) *erato favorinus* Hoppfer

The subspecies *favorinus* was found flying with similarly colour-patterned *H.* (*H.*) *melpomene amaryllis* C. & R. Felder in Tingo María, along the Huallaga River. (Fig. 60, Table 2)

3♂♂, Tingo María, Perú, July 24; 1♂, same locality, July 25.

23. *Heliconius* (*Heliconius*) *clysonimus clysonimus* Latreille

One male was obtained in Guayabetal (900 m), the subtropical area on the eastern slope of the Cordillera Oriental. It was only the specimen collected in the subtropical zone during the expedition. (Fig. 61)

1♂, Guayabetal, Colombia, Aug. 1.

24. *Heliconius* (*Heliconius*) *charithonia bassleri* Comstock & Brown

This species was found visiting the flowers of *Lantana*. (Fig. 62)

1♂, La Pintada, Colombia, Aug. 30; 1♂, same locality, Aug. 31; 2♀♀, Río Guayuriba, Colombia, July 31; 2♂♂, same locality, Aug. 22.

25a. *Heliconius* (*Heliconius*) *sara sara* (Fabricius)

The subecies ***sara*** was commonly found around the secondary forest in the pacific coast region (Fig. 63)

2♂♂, La Troje, Colombia, Sept. 3; 2♂♂, Río Guayabal, Colombia, Sept. 2; 4♂♂, 3♀♀, near Bajo Calima, Colombia, Aug. 12; 3♂♂, 2♀♀, Zabaletas, Colombia, Aug. 11.

25b. *Heliconius* (*Heliconius*) *sara liliana* le Moult

The subspecies *liliana* was commonly seen in the foot of the Cordillera Oriental, near Villavicencio. (Fig. 64)

2♂♂, Cerro Cristo Rey, Colombia, July 29; 1♂, Río Guatiquía, Colombia, July 30; 2♂♂, 1♀, same locality, Aug. 20; 3♂♂, Río Guayuriba, Colombia, July 31.

25c. *Heliconius* (*Heliconius*) *sara magdalena* Bates

One female was collected in a pasture on the Meta Plain, near Villavicencio. The colour pattern closely resembles the subspecies *sara*, and it may be included within the *sara*. (Fig. 65)

1♀, southwest of Villavicencio, Colombia, Aug. 23.

25d. *Heliconius* (*Heliconius*) *sara thamar* (Hübner)

The subspecies *thamar* is widely distributed in the Amazon Basin. In such localities as west of Florencia, Leticia and Tingo María, it was observed flying together with similarly patterned *H.* (*H.*) *wallacei flavescens* Weymer. (Fig. 66)

1♀, west of Florencia, Colombia, Aug. 25; 1♂, Mitú, Colombia, Aug. 17; 2♂♂, same locality, Aug. 18; 3♂♂, Leticia, Colombia, Sept. 8; 1♂, same locality, Sept. 9; 1♂, 1♀, same locality, 10; 1♂, near Leticia, Brasíl, Sept. 11; 2♂♂, same locality, Sept. 12; 3♂♂, Tingo María, Perú, July 24; 2♂♂, same locality, July 25.

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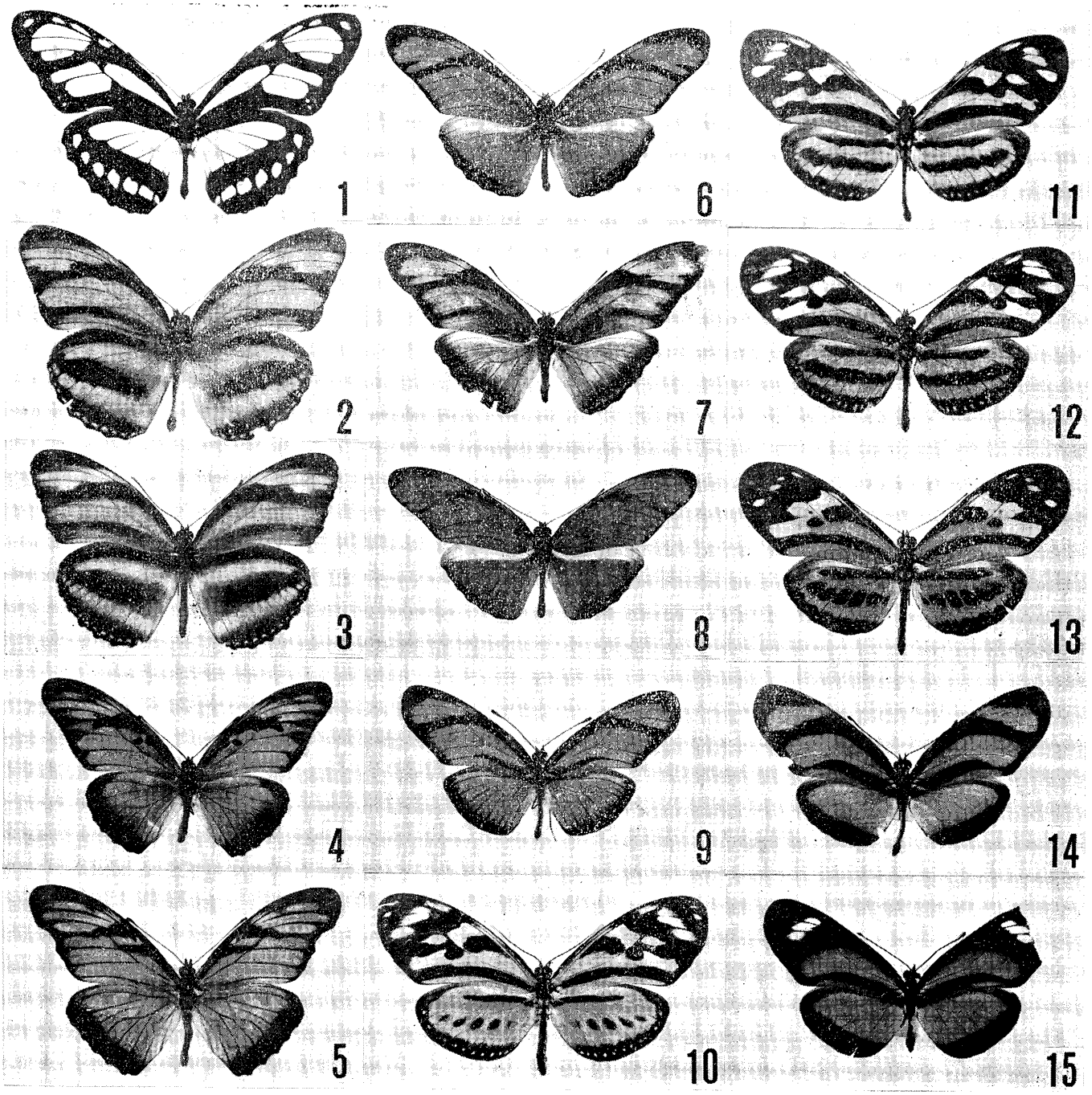

Explanation of figures

Figs. 1–15. Heliconiinae: (1) *Philaethria dido* (Clerck), ♂, Leticia, Sep. 9, FL (forewing length) 50.2 mm; (2) *Dryadula phaetusa phaetusa* (Linnaeus), ♂, Leticia, Sept. 8, FL 51.6 mm; (3) do., ♀, La Pintada, Aug. 30, FL 37.9 mm; (4) *Agraulis lucina* (C. & R. Felder), ♀, west of Florencia, Aug. 25, FL 37.2 mm; (5) *Dione juno juno* (Cramer), ♂, Leticia, Sept. 8, FL 38.9 mm; (6) *Colaenis iulia iulia* (Fabricius), ♂, Río Guatiquía, July 30, FL 43.9 mm; (7) do., ♀, Mitú, Aug. 18, FL 45.8 mm; (8) *C. i. moderata* Stichel, ♂, near Bajo Calima, Aug. 12, EL 41.2 mm; (9) *Heliconius* (*Eueides*) *aliphera aliphera* (Godart), ♂, west of Florencia, Aug. 25, FL 28.0 mm; (10) *H.* (*H.*) *isabella isabella* (Cramer), ♀, Río Guatiquía, July 30, FL 34.8 mm; (11) do., ♂, same data, FL 34.7 mm; (12) do., ♂, near Bajo Calima, Aug. 12, FL 34.7 mm; (13) do., ♂, Tingo María, July 26, 35.2mm, (14) *H.* (*E.*) *lybia lybia* (Fabricius), ♂, Leticia, Sept. 9, FL 30.9 mm; (15) *H.* (*E.*) *lybia olympia* (Fabricius), ♀, near Bajo Calima, Aug. 12, FL 30.8 mm.

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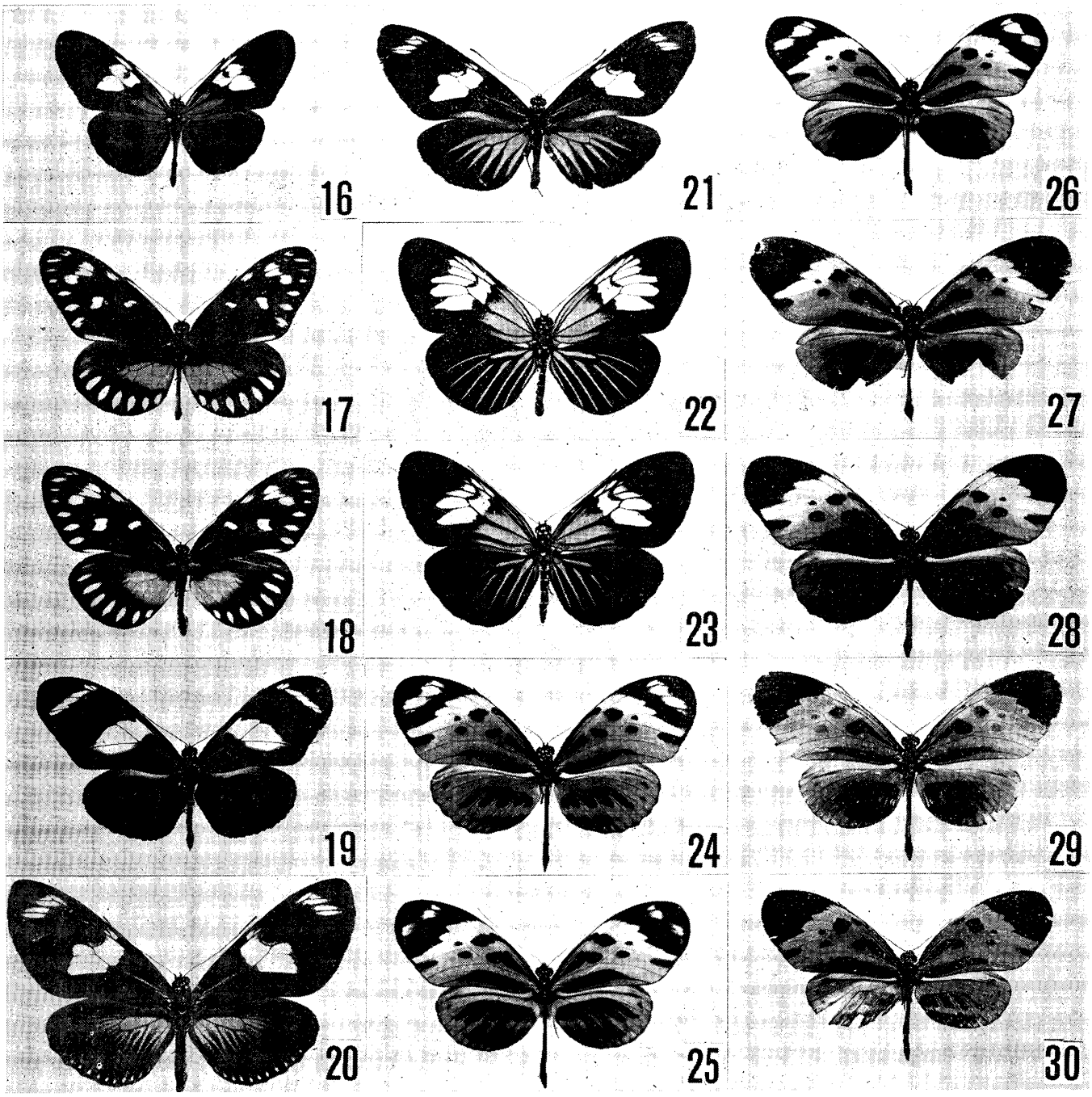

Figs. 16-30. Heliconiinae : (16) *Heliconius* (*Eueides*) *tales heliconioides* (C. & R. Felder). ♂, Cerro Cristo Rey, July 29, FL 34.8mm ; (17) *H.* (*H.*) *godmani* Staudinger, ♂, near Bajo Calima, Aug. 12, FL 41.1mm ; (18) do., ♀, same data, FL 40.8 mm ; (19) *H.* (*H.*) *wallacei flavescens* Weymer, ♂, San José, Aug. 26, FL 42.7 mm ; (20) *H.* (*H.*) *doris* (Linnaeus) f. *doris* (Linnaeus), ♀, west of Florencia Aug. 25, FL 45.1 mm ; (21) do., f. *transiens* Staudinger, ♀, Río Guatiquía, Aug. 20, FL 42.4 mm ; (22) *H.* (*H.*) *xanthocles melete* C. & R. Felder, ♀, Mitú, Aug. 18, FL 40.0 mm ; (23) *H.* (*H.*) *x. flavosia*, Kaye, ♀, Río Guayuriba, July 31, FL 39.7 mm ; (24) *H.* (*H.*) *aristiona* Hewitson f. *idalion* Weymer, ♂, Cerro Cristo Rey, July 29, FL 41.9 mm ; (25) do., ♂, Río Guatiquía, July 30, FL 39.4 mm ; (26) do., f. *confluens* Neustetter, ♂, Cerro Cristo Rey, July 29, FL 38.0 mm ; (27) do., f. *euphone* C. & R. Felder, ♂, west of Florencia, Aug. 25, FL 30.6 mm ; (28) do., f. *messene* C. & R. Felder, ♂, San José, Aug. 26, FL 40.6 mm ; (29) do., f. *timaeus* Weymer, ♂, same data, FL 40.1 mm ; (30) do., ♂, Tingo María, July 26, FL 38.6 mm.

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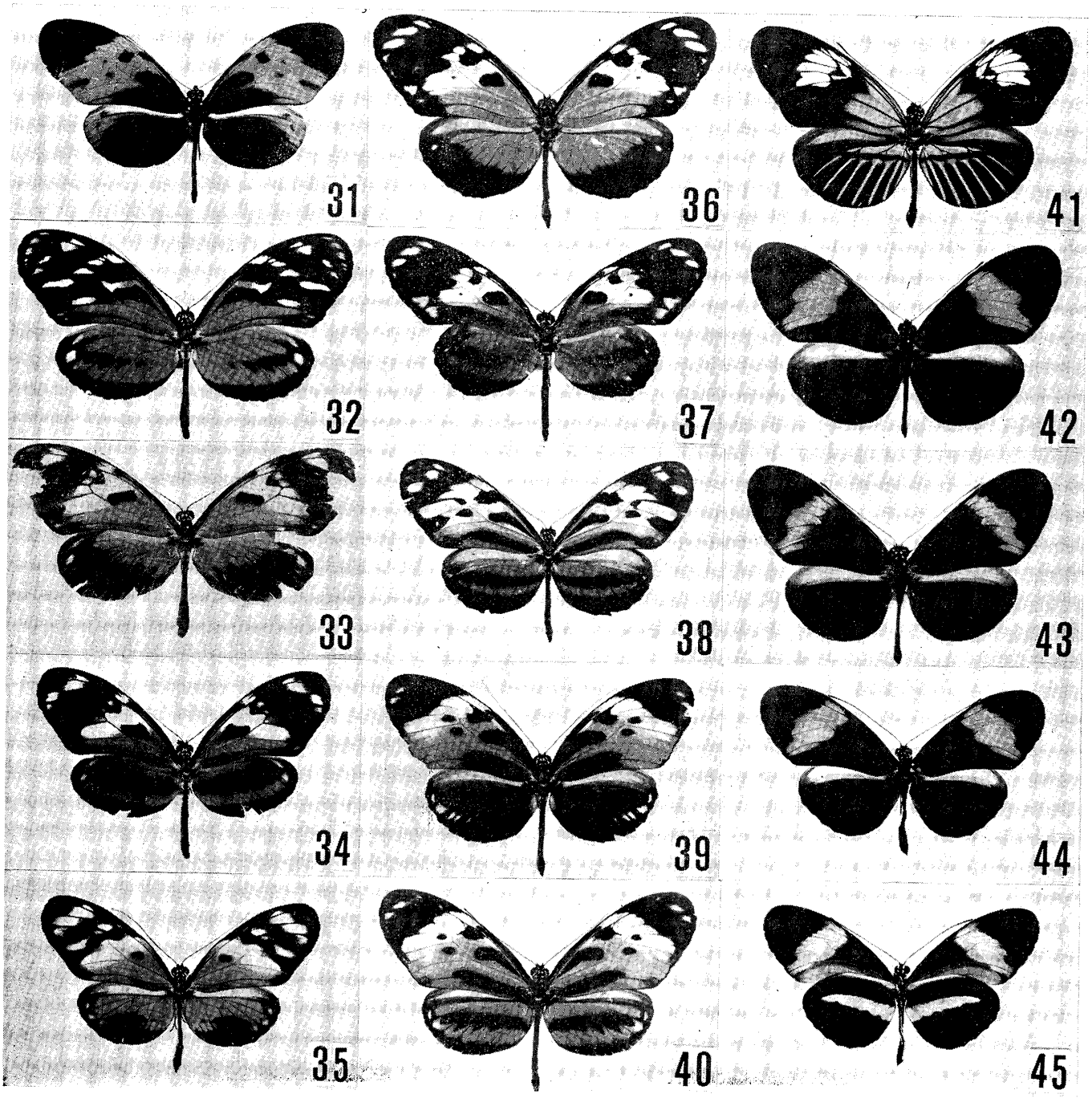

Fig. 31-45. Heliconiinae. (31) *Heliconius* (*Heliconius*) *aristiona* Hewitson f. *bicoloratus* Butler, ♂, Tingo María, July 25, FL 41.4 mm ; (32) *H.*(*H.*) *ismenius ismenius* Latreille, ♀, San José, Aug. 26, FL 41.2 mm ; (33) *H.*(*H.*)*i. metaphorus* Weymer f. *metaphorus* Weymer, ♀, Río Guayabal, Sept. 2, FL 44.6 mm ; (34) do., f. *faunus* Staudinger, ♀, near Bajo Calima, Aug. 12, FL 41.6 mm ; (35) *H.*(*H.*) *numata silvana* (Cramer), ♂, Leticia, Sept. 10, FL 38.5 mm ; (36) *H.* (*H.*) *ethilla melicerta* Bates f. *melicerta* Bates, ♂, Zabaletas, Aug. 11, FL 46.6 mm ; (37) do., f. *semiphorus* Staudinger, ♀, same data, FL 44.3 mm ; (38) do., f. *holcophora* Staudinger, ♂, La Pintada Aug. 30, FL 40.3 mm ; (39) *H.*(*H.*) *e. ithaca* C. & R. Felder, f. *ithaca* C. & R. Felder, ♂, Río Guatiquía, July 30, FL 42.4 mm ; (40) do., f. *vittatus* Butler, ♂, same locality, Aug. 20, FL 43.1 mm ; (41) *H.*(*H.*) *elevatus schmidt-mummi* ssp. nov., holotype, ♂, near Leticia, Sept. 11, FL 42.4 mm ; (42) *H.*(*H.*) *melpomene melpomene* (Linnaeus), f. *melpomene* (Linnaeus), ♂, Río Guayuriba, Aug. 22, FL 36.0 mm ; (43) do., ab. *melpomenides* Riffarth, ♂, same data, FL 32.8 mm ; (44) *H.* (*H.*) *m. vulcanus* Butler, ♂, near Bajo Calima, Aug. 12, FL 37.6 mm ; (45) do., underside.

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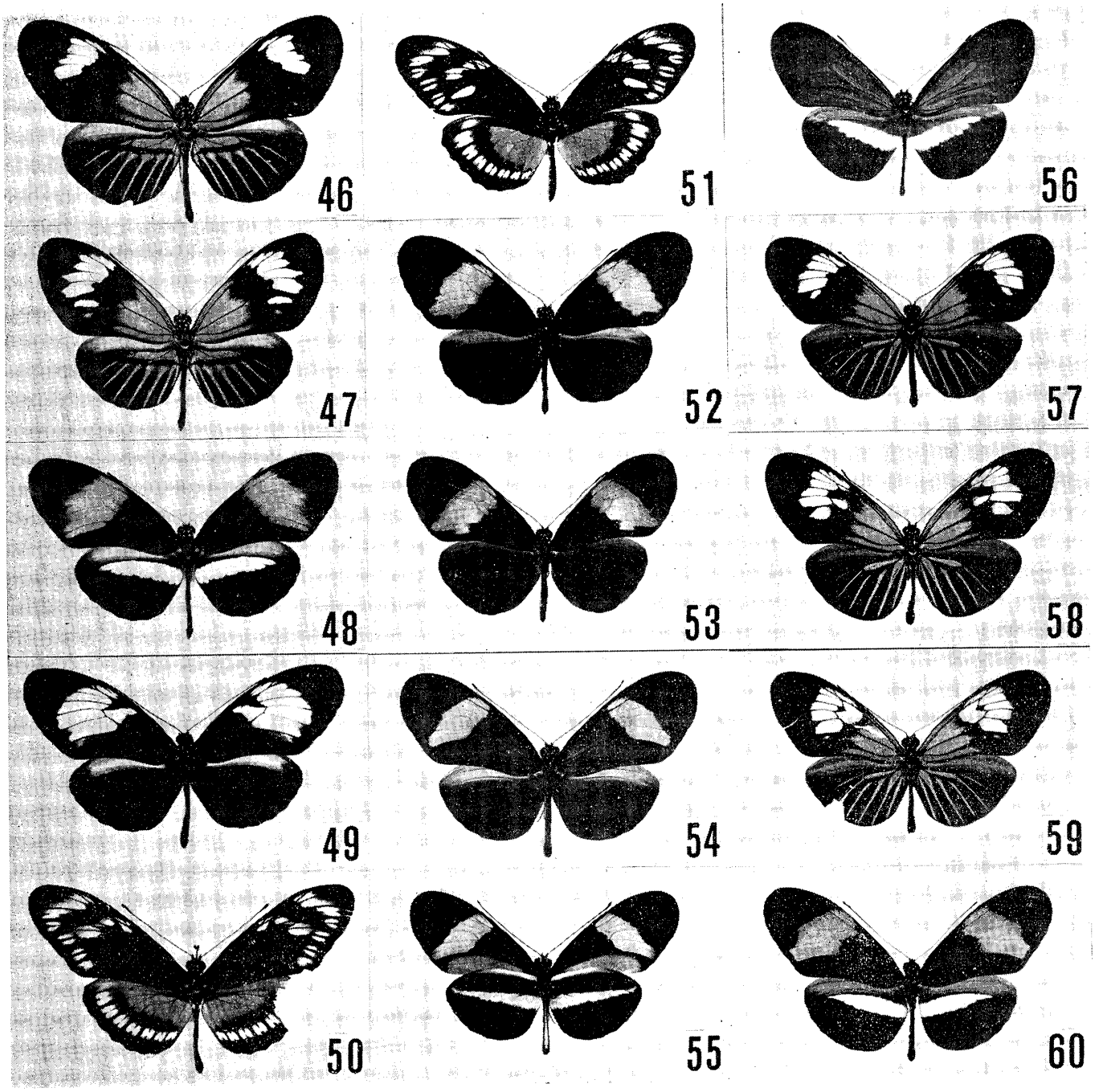

Figs. 46–60. Heliconiinae : (46) *Heliconius* (Heliconius) *melpomene aglaope* C. & R. Felder, f. *aglaope* C. & R. Felder, ♂, San José, Aug. 26, FL 37.8 mm ; (47) do., f. *rubra* Stichel, ♂, west of Florencia, Aug. 25, FL 36.4 mm ; (48) *H.* (*H.*) *m. amaryllis* C. & R. Felder, ♂, Tingo María, July 24, FL 37.0 mm ; (49) *H.* (*H.*) *cydno zelinde* Butler, ♂, Zabaletas, Aug. 11, FL 42.4 mm ; (50) *H.* (*H.*) *longarenus* (Hewitson), ♂, near Bajo Calima, Aug. 12, FL 46.5 mm ; (51) do., ♀, Río Guayabal Sept. 2, FL 41.4 mm ; (52) *H.* (*H.*) *erato hydarus* (Hewitson), f. *adana* Seitz, ♂, Río Guatiquía, Aug. 20, FL 39.0 mm; (53) do., aberrant form (forewing red patch proximally paler), ♀, same data, FL 37.0 mm ; (54) *H.* (*H.*) *e. venus* Staudinger, ♂, Río Guayabal, Sept. 2, EL 37.2 mm ; (55) do., underside ; (56) *H.* (*H.*) *e. chestertonii* Hewitson, ♂, La Pintada, Aug. 30, FL 33.4 mm ; (57) *H.* (*H.*) *e. emma* Riffarth ♂, San José, Aug. 26, FL 37.8 mm ; (58) *H.* (*H.*) *e. reductimacula* Bryk, ♂, Leticia Sept. 10, FL 38.8 mm ; (59) *H.* (*H.*) *e. venustus* Salvin, ♂, Mitú, Aug. 18, FL 37.4 mm ; (60) *H.* (*H.*) *e. favorinus* Hoppfer, ♂, Tingo María, July 24, FL 38.1 mm.

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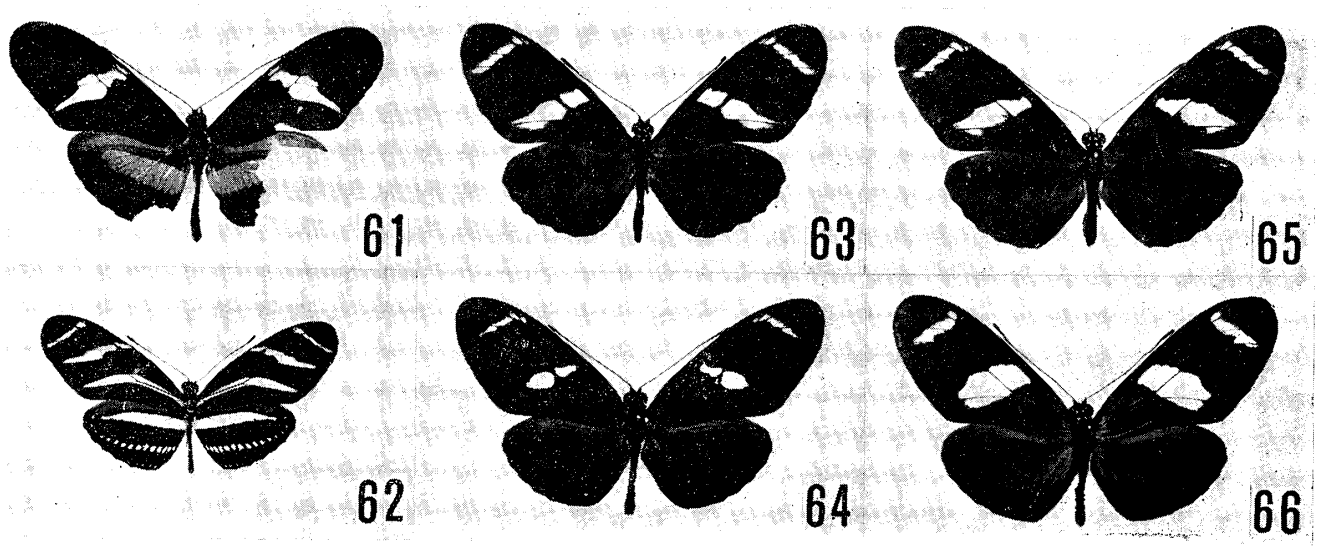

Figs. 61-66. Heliconiinae : (61) *Heliconius* (*Heliconius*) *clysonimus clysonimus* Latreille, ♂, Guayabetal, Aug. 1, FL 36.2 mm ; (62) *H.* (*H.*) *charithonia bassleri* Comstock & Brown, ♂, Río Guayuriba, Aug. 22, FL 34.3 mm ; (63) *H.* (*H.*) *sara sara* (Fabricius), ♀, near Bajo Calima, Aug. 12, FL 37.3 mm ; (64) *H.* (*H.*) *s. liliana* le Moult, ♂, Río Guatiquía, July 30, FL 30.8 mm ; (65) *H.* (*H.*) *s. magdalena* Bates, ♀, southwest of Villavicencio, Aug. 23, FL 33.3 mm. (66) *H.* (*H.*) *s. thamar* (Hübner), ♂, Mitú, Aug. 18, FL 37.3 mm.

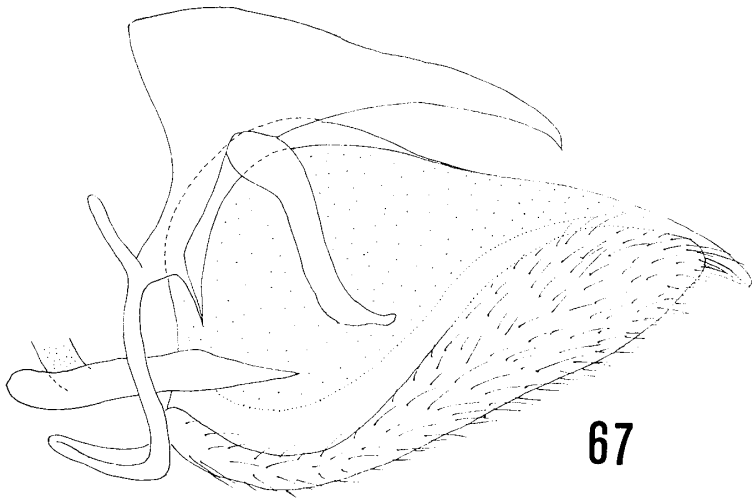

Fig. 67. Male genitalia of *Heliconius* (*Heliconius*) *elevatus schmidt-mummi* ssp. nov., Leticia, Sept. 10.

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Table 1. Mimetic relationships among the three species of *Heliconius* and the Ithomiinae observed during the expedition, 1973.

locality	*Heliconius* (Nymphalidae)			Ithomiinae (Danaidae)
	aristiona	*ismenius*	*ethilla*	
Quibdó		*metaphorus*	*melicerta*	
		faunus	*semiphorus**	*Ceratinia tutia*
Buenaventura		*metaphorus**	*melicerta*	*Melinaea idae idae*
		faunus	*semiphorus*	
Cauca Valley			*holcophora*	*Mechanitis istmia caucaensis*
Villavicencio	*messene*, *confluens*		*ithaca*	*Mechanitis messenoides messenoides*; *Hypothyris rowena*
	idalion		*vittatus*	*Melinaea menophilus menophilus*
Florencia	*messene*, *confluens*, *euphone*			*Hypothyris honesta honesta*
Tingo María	*bicoloratus*			*Melinaea comma simulator*

*supposed to be distributed

Table 2. Mimetic relationships among *Heliconius* (*Heliconius*) *melpomene*, *H.* (*H.*) *erato* and the other Heliconian butterflies observed during the expedition, 1973.

locality	*Heliconius* (*Heliconius*)		other Heliconian butterflies
	melpomene	*erato*	
Pacific coast region	*vulcanus*	*venus*	
Cauca Valley		*chestertonii*	
Villavicencio	*melpomene*	*adana*	
Florencia	*aglaope*	*emma*	
Mitú		*venustus*	*xanthocles melete*; *aoede lucretius**
Leticia		*reductimacula*, *lativitta*	*elevatus schmidt-mummi* ssp. nov.
Tingo María	*amaryllis*	*favorinus*	

*reported in Brown (1973).

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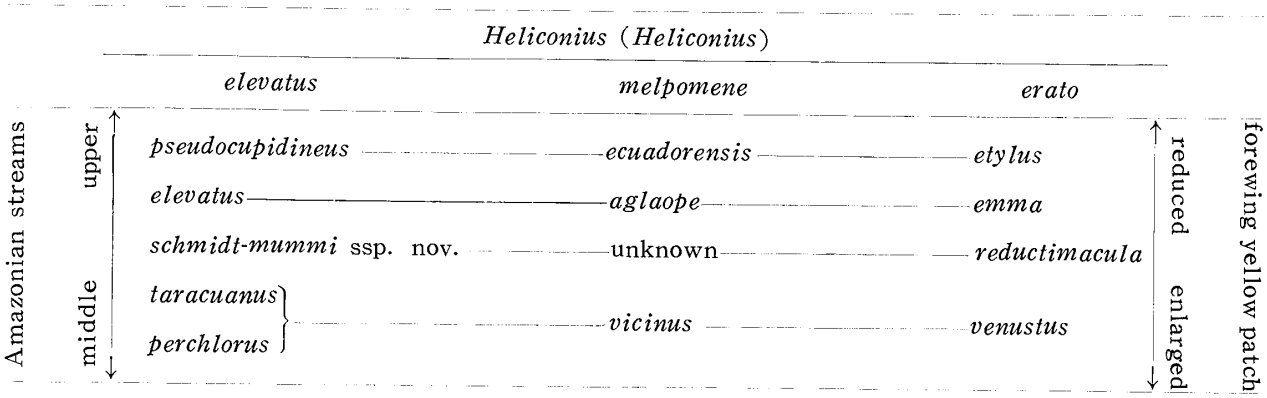
Table 3. Similarity in colour patterns among the subspecies of the three dennis-ray patterned Heliconian butterflies distributed from the middle to the upper streams of the Amazon River.



Resumen

Se publica la lista con los datos y unas notas de la subfamilia de los Heliconiinae (Lepidóptera : Nymphalidae), coleccionada por "La Expedición Japonesa a las Zonas Amazonicas, 1973". Veinticinco especies (42 subespecies) de los Heliconiinae fueron coleccionadas principalmente en el territorio de Colombia y la mayor parte de los especímenes fue obtenida en la zona tropical.

En esta momoria, se describe una subespecie nueva, *Heliconius* (*Heliconius*) *elevatus schmidt-mummi*, la cual fue coleccionada en la selva de la vecinidad de Leticia, los territorios de Colombia y Brasíl.

要　　約

"奥アマゾン探険，1973" により，南米コロンビアとその隣接地域において採集されたドクチョウ亜科（タテハチョウ科）25種，42亜種，341個体の記録を報告する．これらは，コロンビアの太平洋岸，カウカ川流域，アンデス東部山脈の周辺，アマゾン河上流の平原，およびペルーのウアジャーガ川流域などの，主として熱帯地域において採集されたものである．またこの報文では，ドクチョウの一新亜種 *Heliconius* (*Heliconius*) *elevatus schmidt-mummi* を記載した．この亜種は，コロンビア南端のレティシア付近（コロンビアおよびブラジル領を含む）の熱帯降雨林に分布しており，新亜種名はボゴタのドクチョウ研究家のシュミット＝ムム博士 (Dr. Ernesto W. Schmidt-Mumm) に献呈されたものである．

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